

SYSTEM ARCHITECTURE BLOCK DIAGRAM

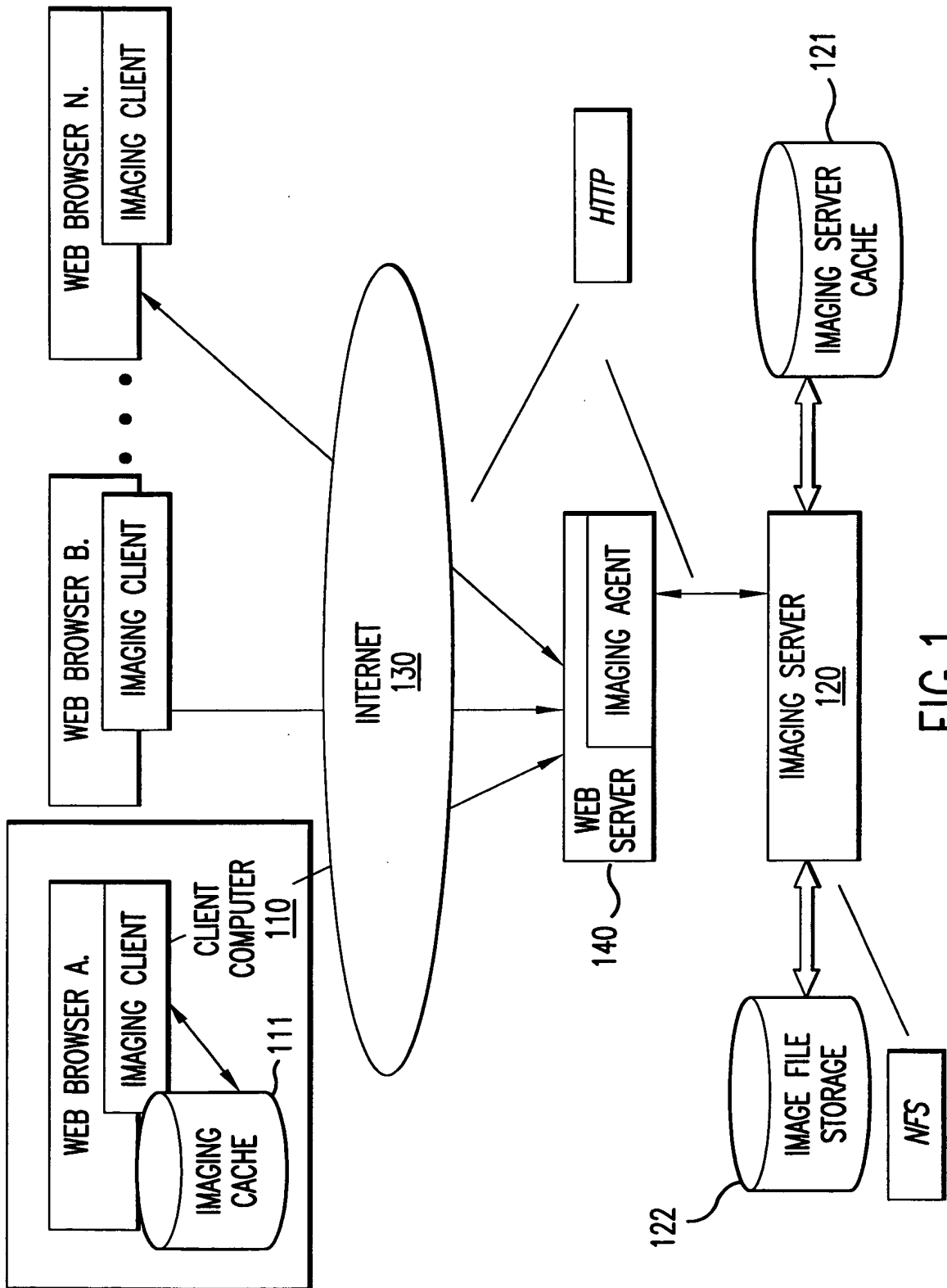


FIG.1

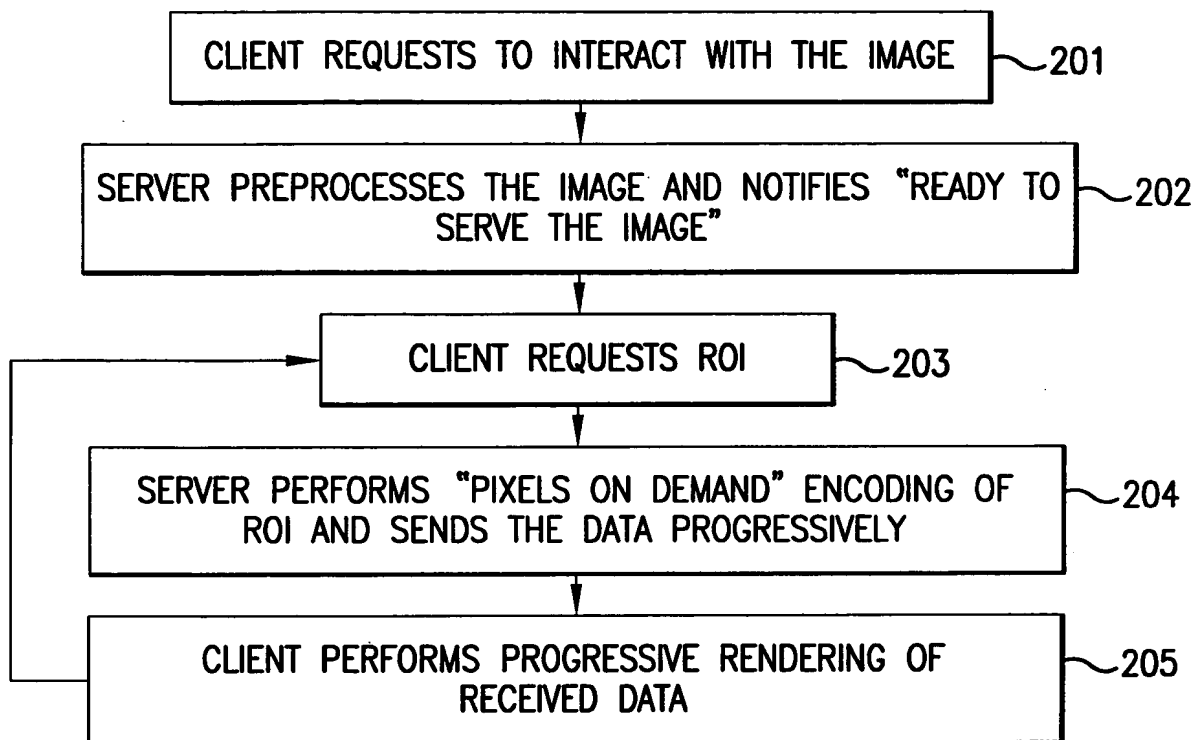


FIG.2

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"DELETED" 29875860

3/26

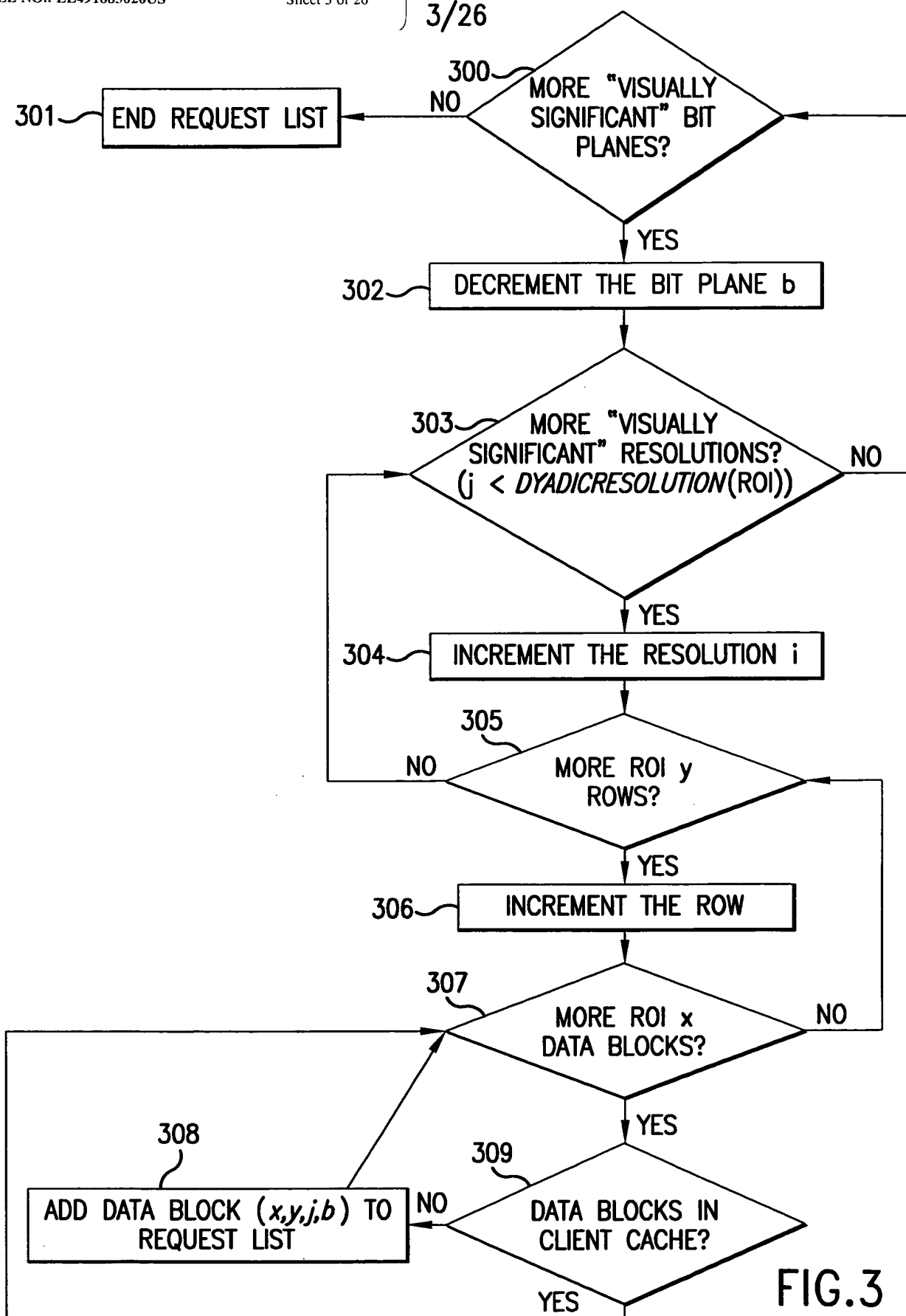


FIG.3

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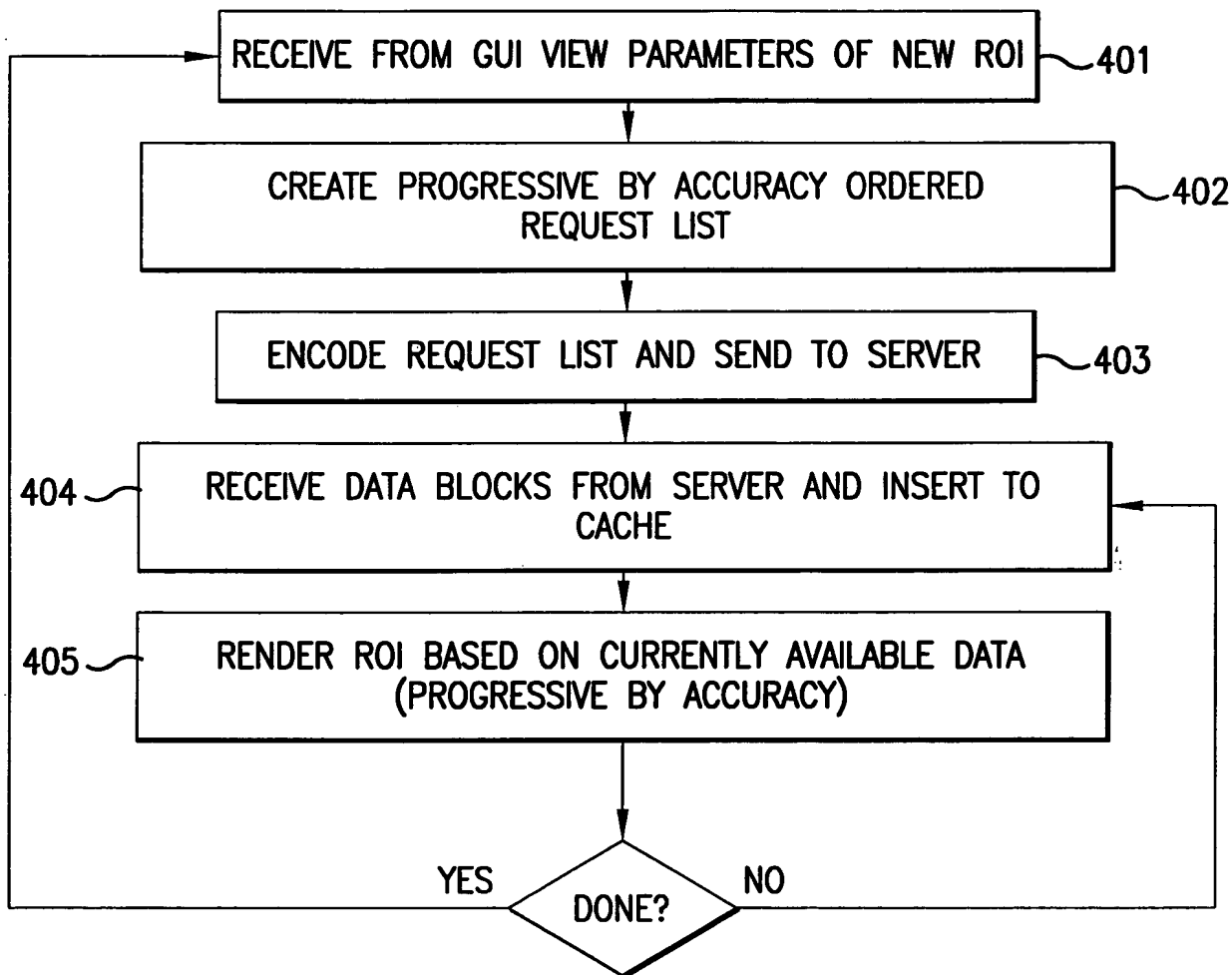


FIG.4

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"PUBLISHED"

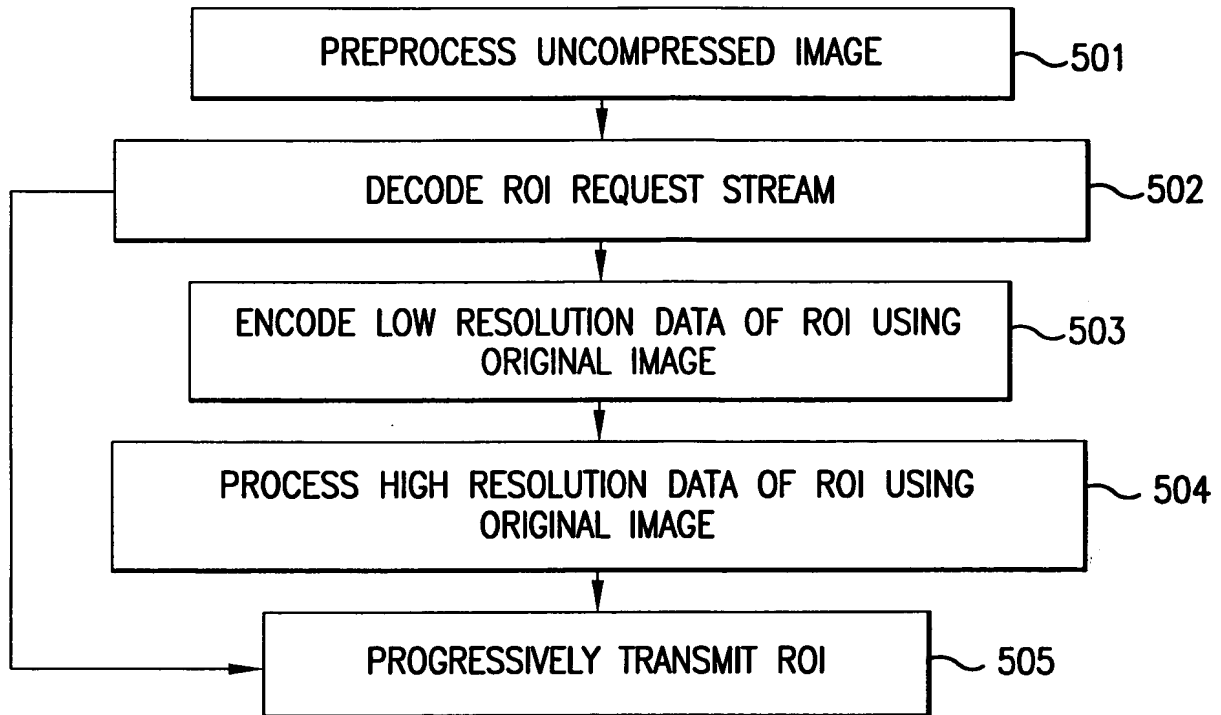


FIG.5

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20010417

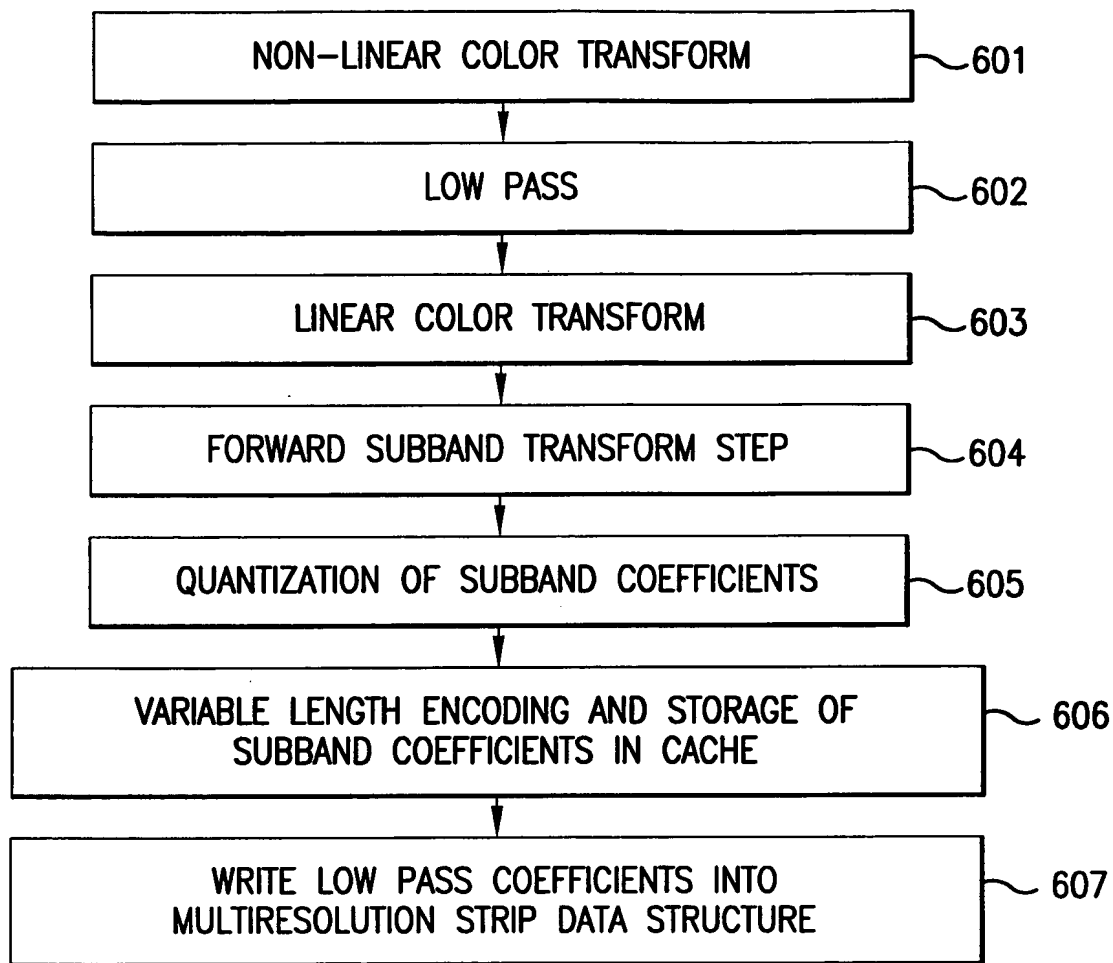


FIG.6

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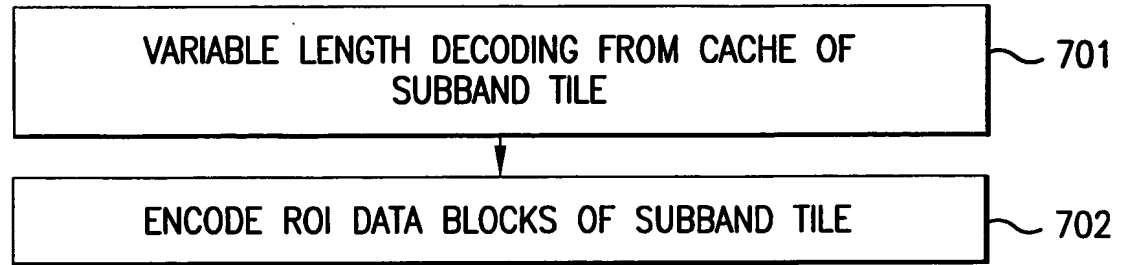


FIG.7

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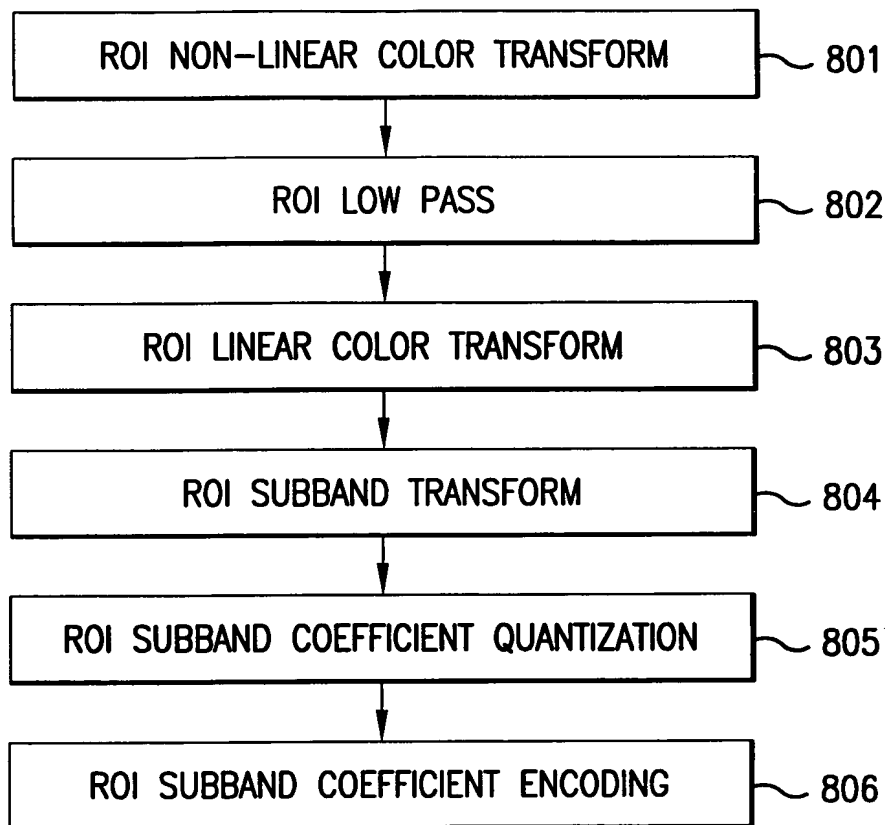


FIG.8

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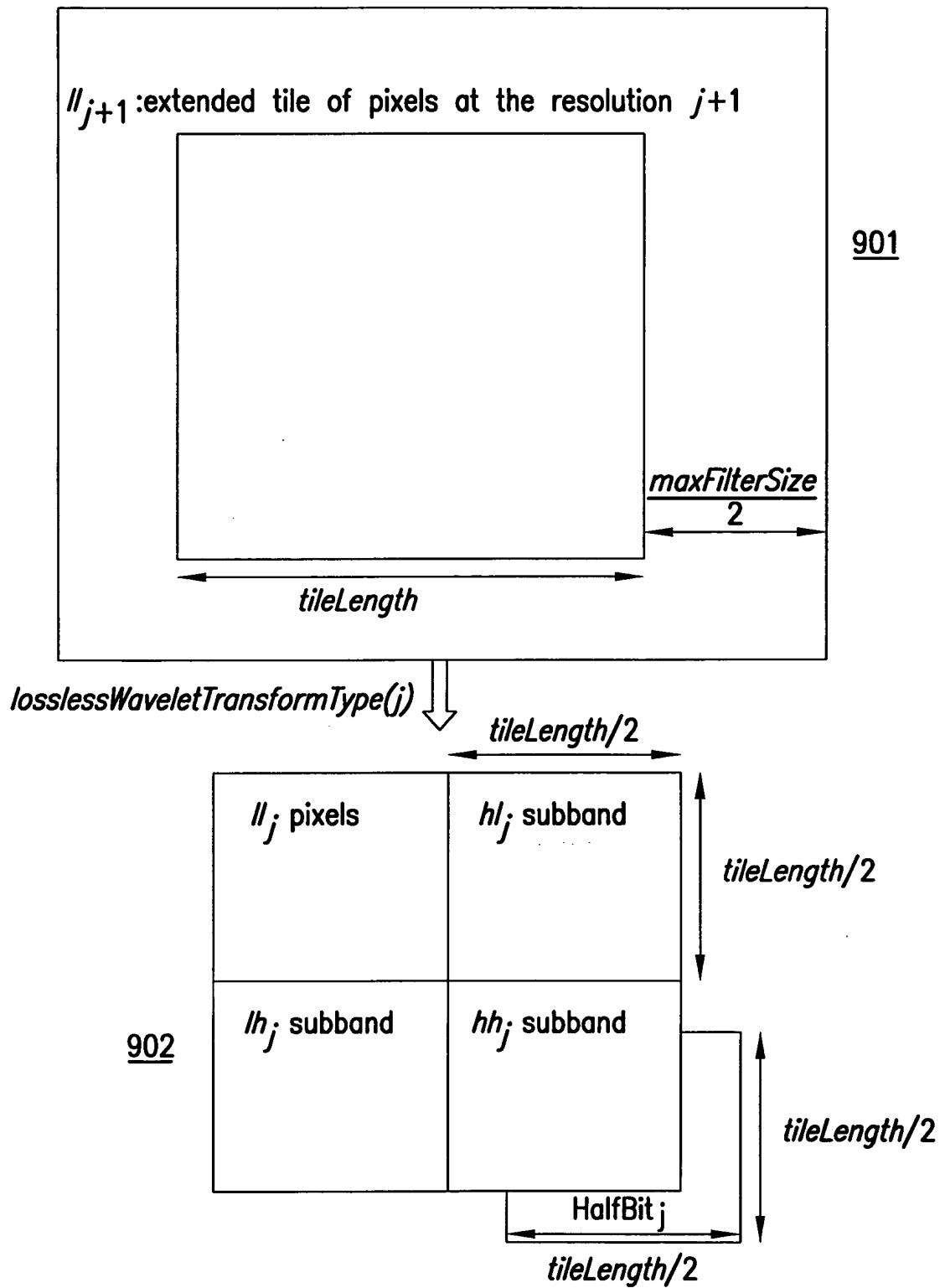


FIG.9

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10/26

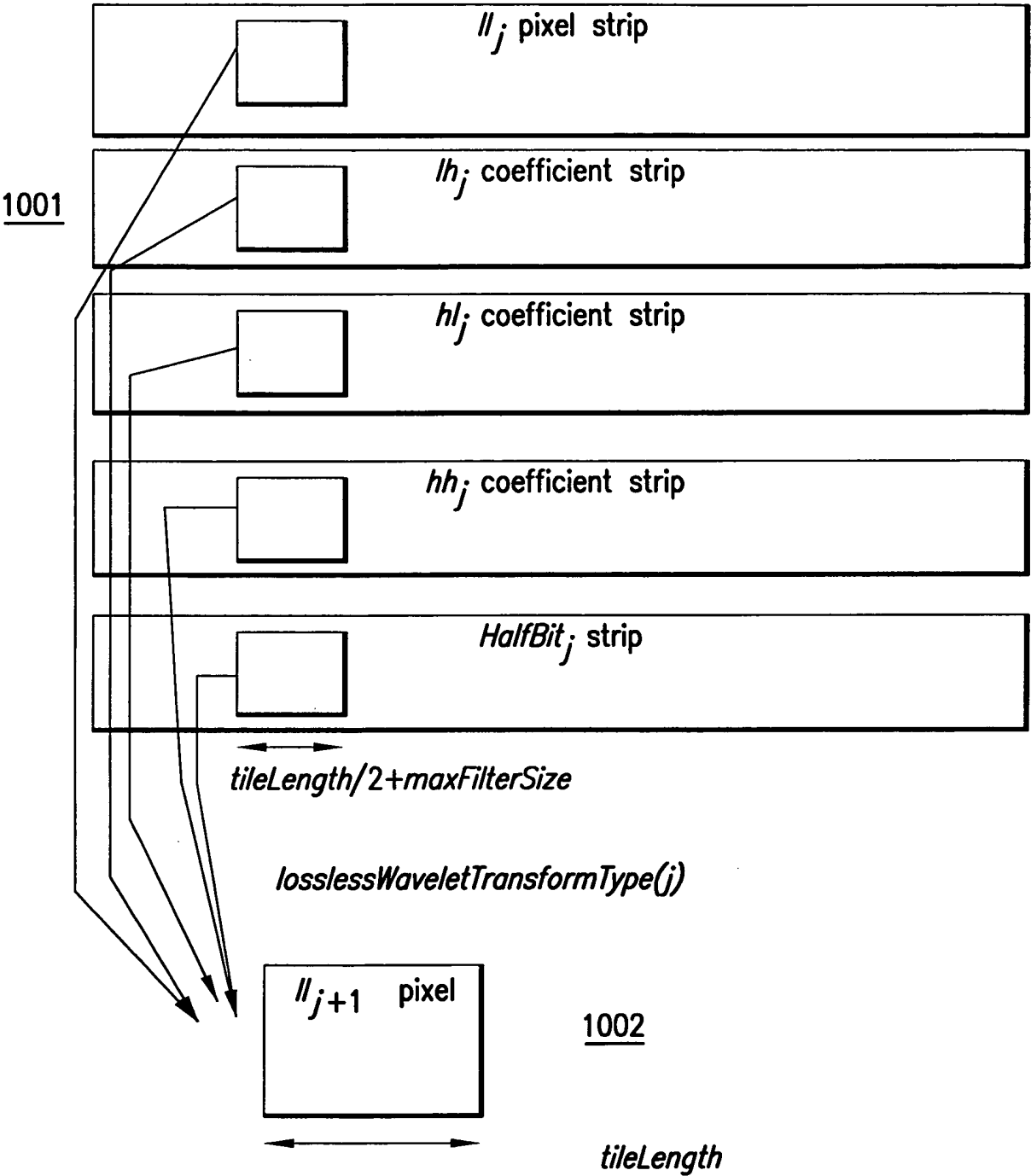


FIG.10

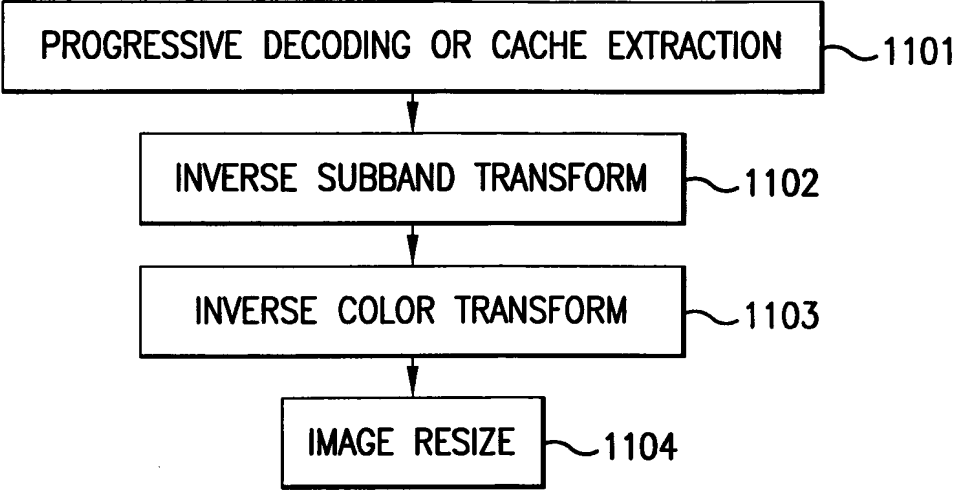


FIG.11

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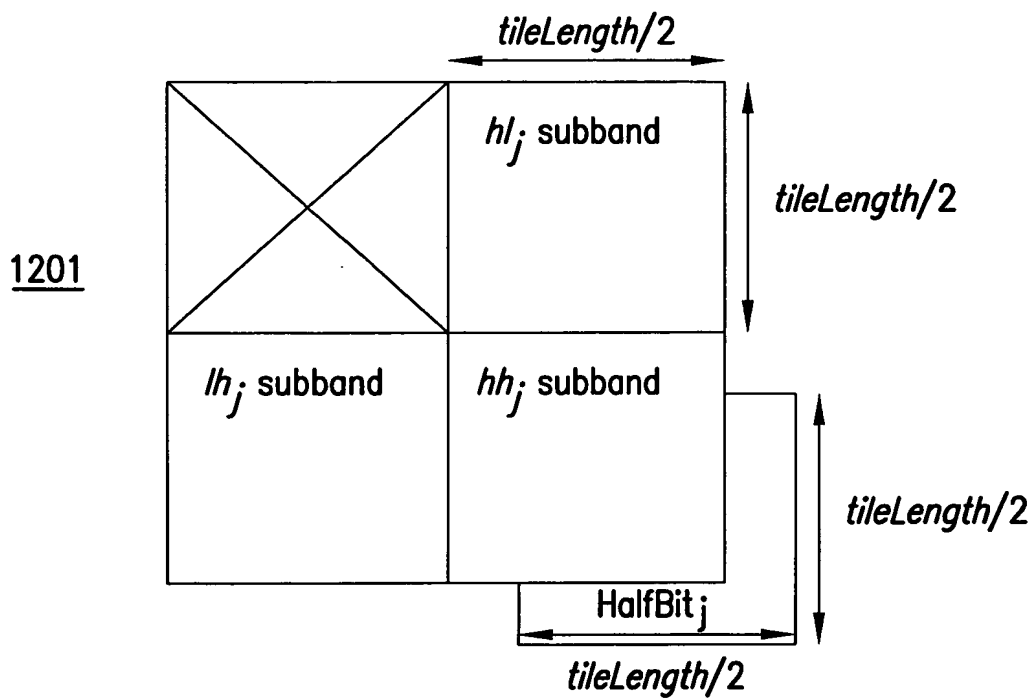


FIG.12

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RGB <--> YUV REVERSIBLE CONVERSION

FORWARD:

$$Y_r = \left\lfloor \frac{R + 2G + B + 2}{4} \right\rfloor$$

$$U_r = R - G$$

$$V_r = B - G$$

INVERSE:

$$G = Y_r - \left\lfloor \frac{U_r + V_r + 2}{4} \right\rfloor$$

$$R = U_r + G$$

$$B = V_r + G$$

1301

FIG.13

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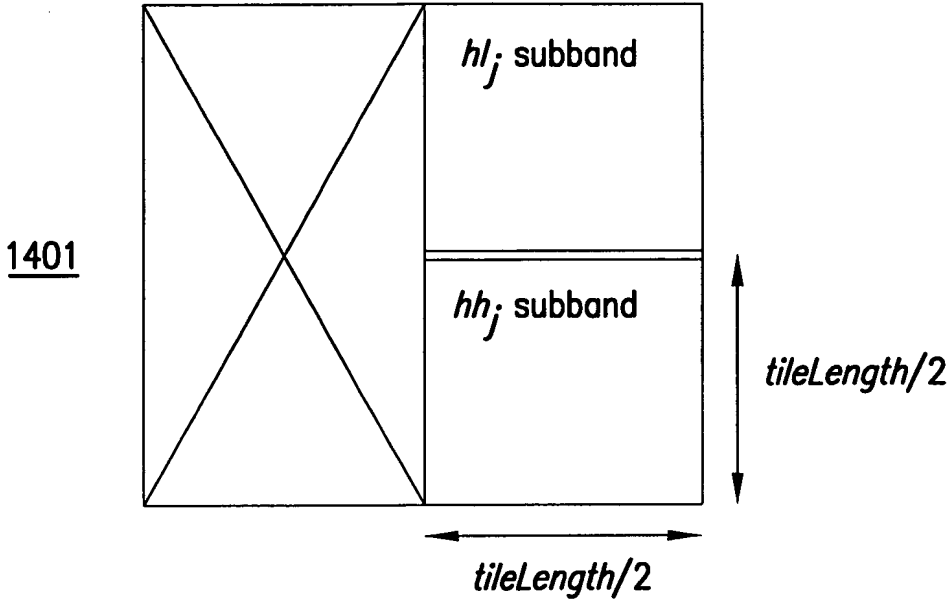


FIG.14

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```
bitModel.startModel () ;
zeroCoefModel.startModel () ;
coefSignModel.startModel () ;

while (encoder.moreCoef ()) {
    if (encoder.isCoefReported ()) {

arithmetic_encode_symbol (bitModel,encoder.reportedCoefPrec
isionBit ()) ;
    }
    else {
        if (encoder.isCoefExactZero ()) ;
        arithmetic_encode_symbol (zeroCoefModel,true) ;
        else {
            arithmetic_encode_symbol (zeroCoefModel,false) ;
            arithmetic_encode_symbol (coefSignModel,encoder.getCoefSign ()) ;
        }
    }
}
```

FIG.15a

```
bitModel.startModel () ;

for (int i = 0 ; i < hBlockSize ; i++) {
    for (int j = 0 ; j < hBlockSize ; j++) {
        arithmetic_encode_symbol (bitModel,
coefHalfBit [i] [j]) ;
    }
}
```

FIG.15b

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RECEIVED

16/26

```

        bitModel.startModel() ;

zeroCoefModel.startModel() ;
coefSignModel.startModel() ;

decoder.initializeLSBPlaneCoefScan () ;

while (decoder.moreCoef ()) {
    if (decoder.isCoefReported ()) {
        if (decoder.isLHCoef ()) {
            decoder.updateLSB (0) ;
        }
        else {
            decoder.updateLSB (arithmetic_decoder_symbol (bitModel)) ;
        }
    }
    else {
        if (!decoder.isLHCoef ()) {
            if (!arithmetic_decoder_symbol (zeroCoefModel))
                decoder.setLSB (arithmetic_decoder_symbol (coefSignMode
                    1)) ;
        }
    }
}

```

FIG.16a

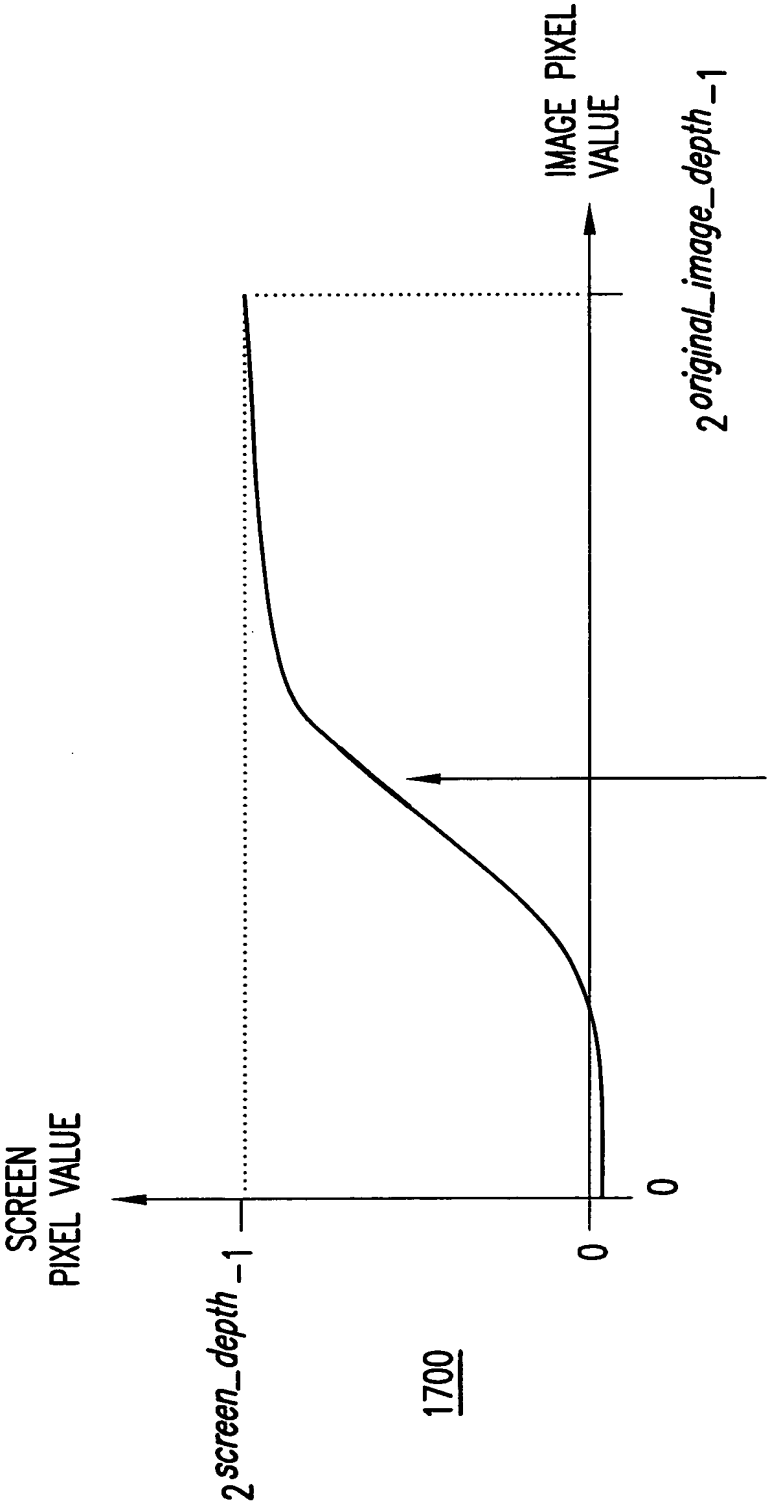
```

bitModel.startModel () ;
for (int i = 0 ; i < hBlockSize ; i++) {
    for (int j = hBlockSize ; j ; j--,p++) {
        coefHlafBit [i] [j] = arithmetic_decoder_symbol (bitModel) ;
    }
}

```

FIG.16b

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 20010417



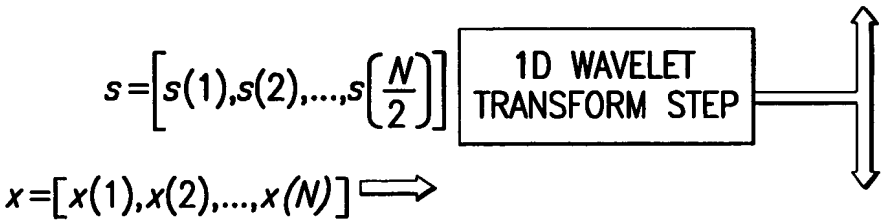
MAXIMAL GRADIENT
1701

FIG.17

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18/26

1800



$$d = [d(1), d(2), \dots, d(\frac{N}{2})]$$

$$x = \begin{bmatrix} x(1,1) & x(1,2) & \dots & x(1,N) \\ x(2,1) & x(2,2) & \dots & x(2,N) \\ \vdots & \vdots & \ddots & \vdots \\ x(M,1) & x(M,2) & \dots & x(M,N) \end{bmatrix}$$



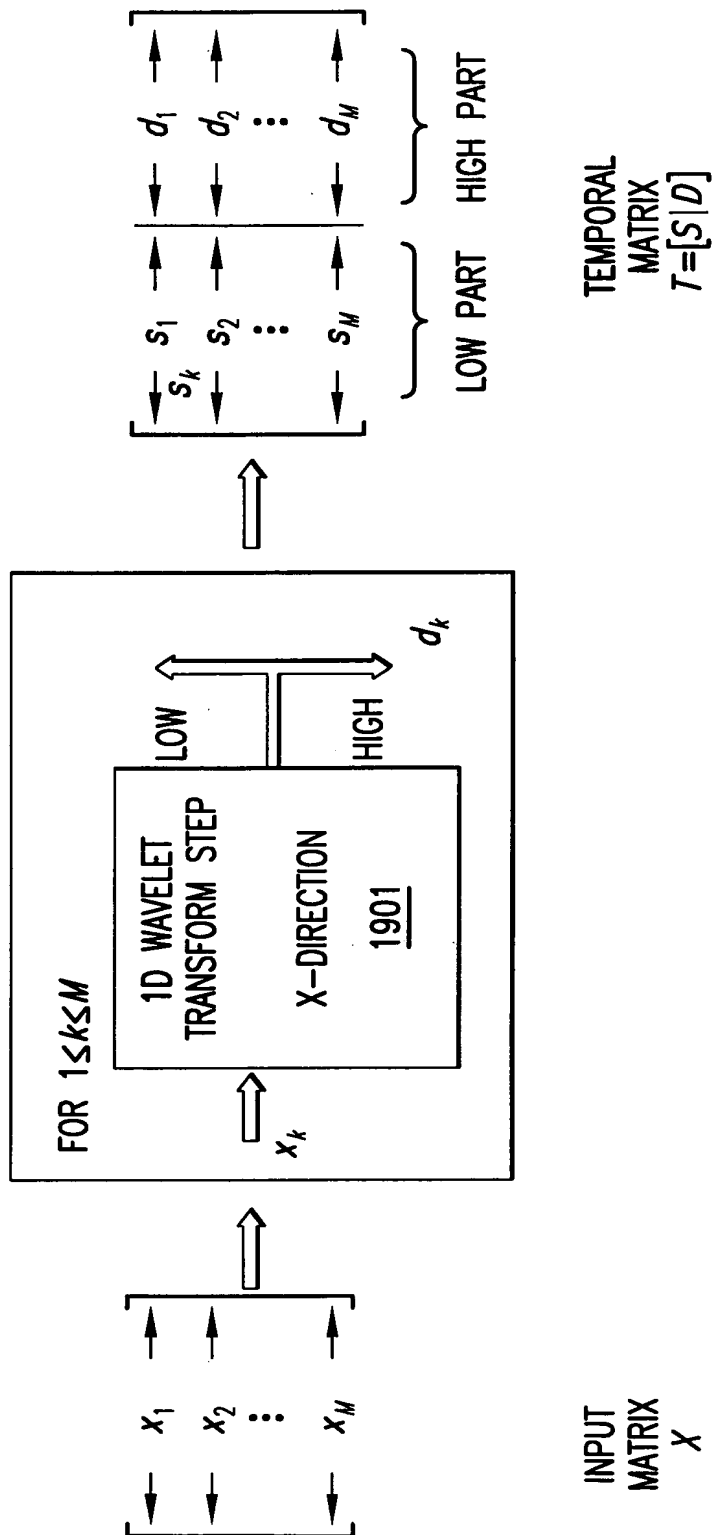
1801

2D WAVELET TRANSFORM STEP

$$\hat{x} = \left[\begin{array}{c|c} LL & HL \\ \hline LH & HH \end{array} \right] = \begin{bmatrix} ll(1,1) & \dots & ll(1,N/2) & hl(1,1) & \dots & hl(1,N/2) \\ \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ ll(M/2,1) & \dots & ll(M/2,N/2) & hl(M/2,1) & \dots & hl(M/2,N/2) \\ lh(1,1) & \dots & lh(1,N/2) & hh(1,1) & \dots & hh(1,N/2) \\ \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ lh(M/2,1) & \dots & lh(M/2,N/2) & hh(M/2,1) & \dots & hh(M/2,N/2) \end{bmatrix}$$

FIG.18

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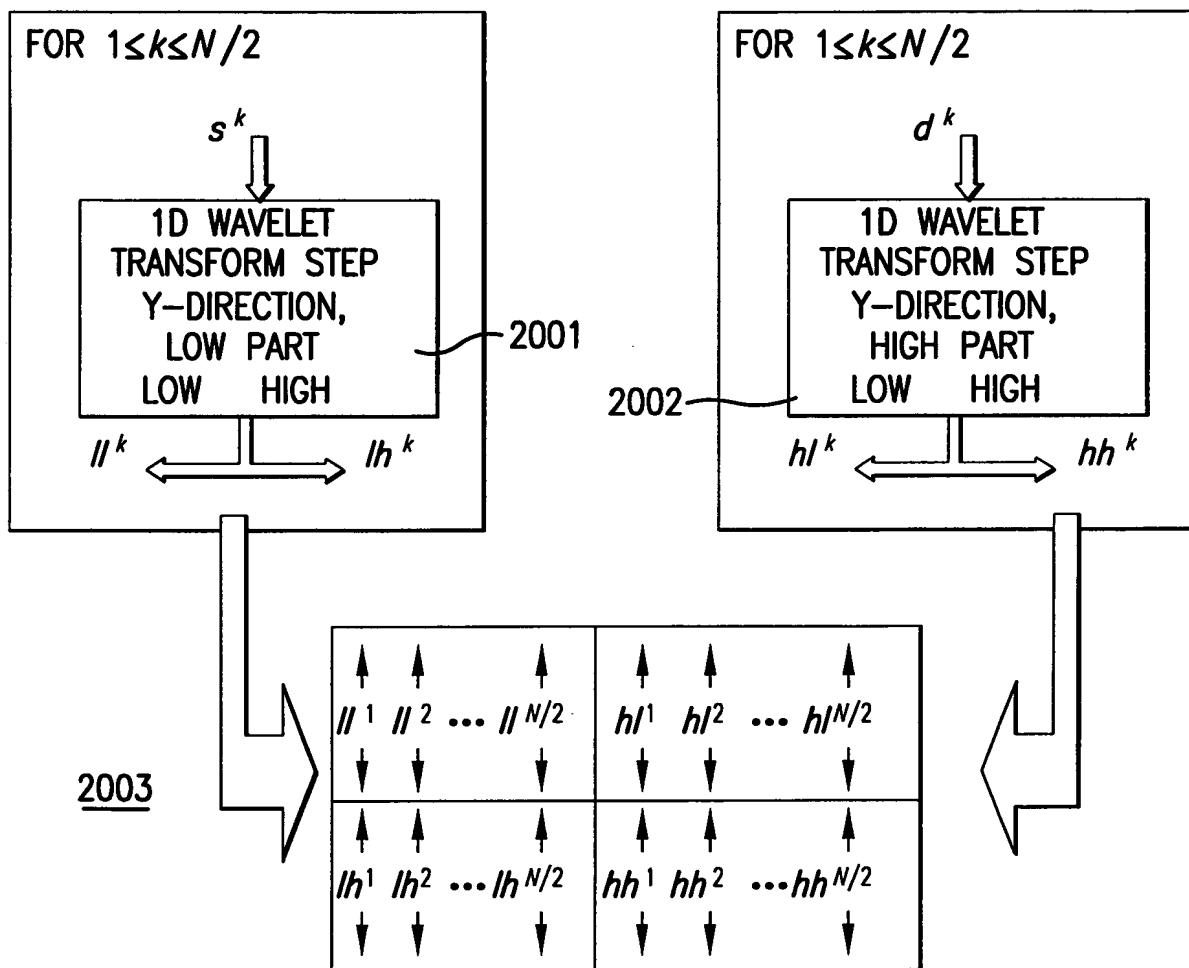


1901

FIG.19

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$$\left[\begin{array}{c|c} \begin{array}{c} \uparrow \quad \uparrow \quad \dots \quad \uparrow \\ s^1 \quad s^2 \quad \dots \quad s^{N/2} \\ \downarrow \quad \downarrow \quad \dots \quad \downarrow \end{array} & \begin{array}{c} \uparrow \quad \uparrow \quad \dots \quad \uparrow \\ d^1 \quad d^2 \quad \dots \quad d^{N/2} \\ \downarrow \quad \downarrow \quad \dots \quad \downarrow \end{array} \end{array} \right] \quad 2000$$



OUTPUT MATRIX

$$\hat{X} = \left[\begin{array}{c|c} LL & HL \\ \hline LH & HH \end{array} \right] \quad 2004$$

FIG.20

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LET I BE THE ORIGINAL IMAGE,



FOR $0 < i < \text{LEVELS}$



$LL_{\text{LEVELS}-1}$

2100

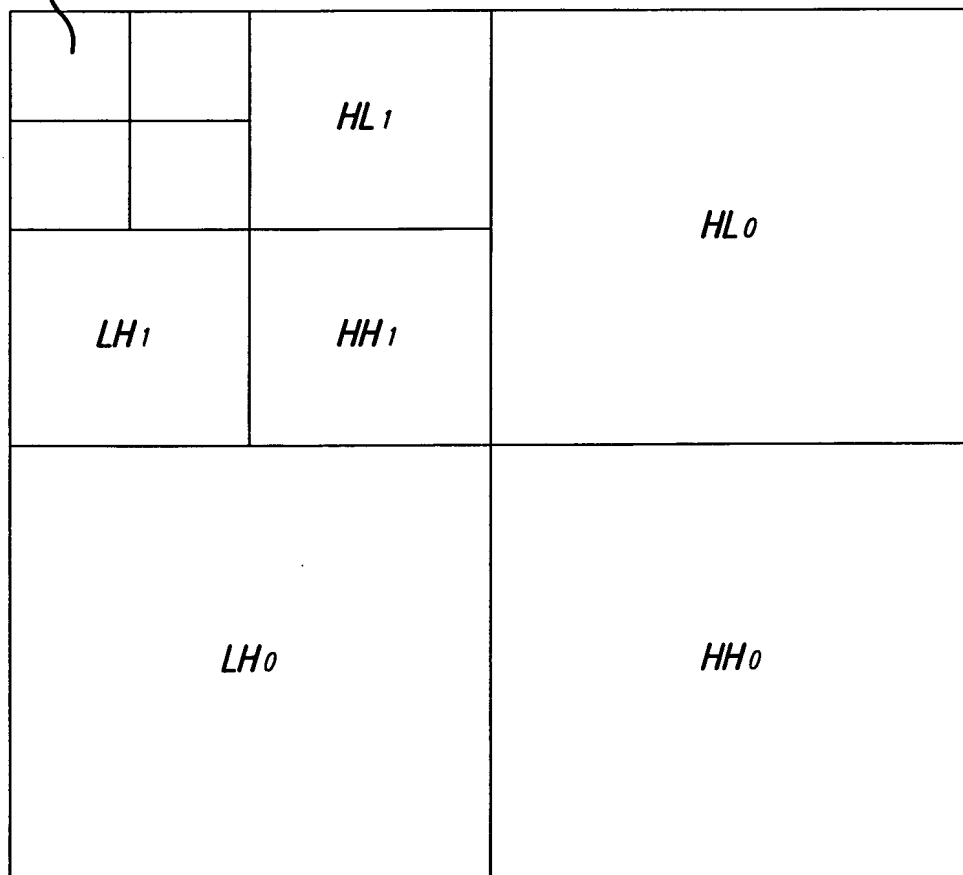


FIG.21

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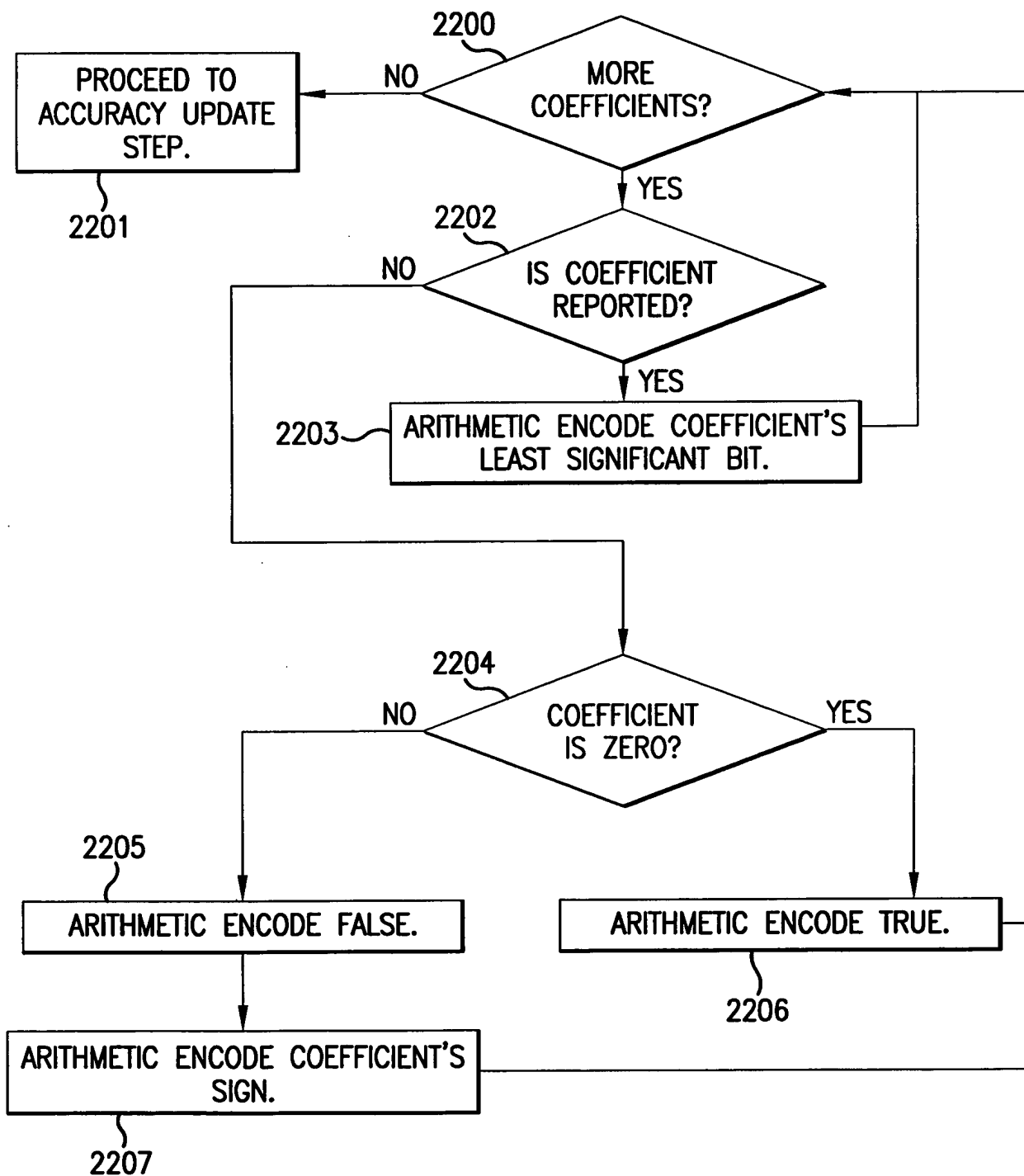


FIG.22

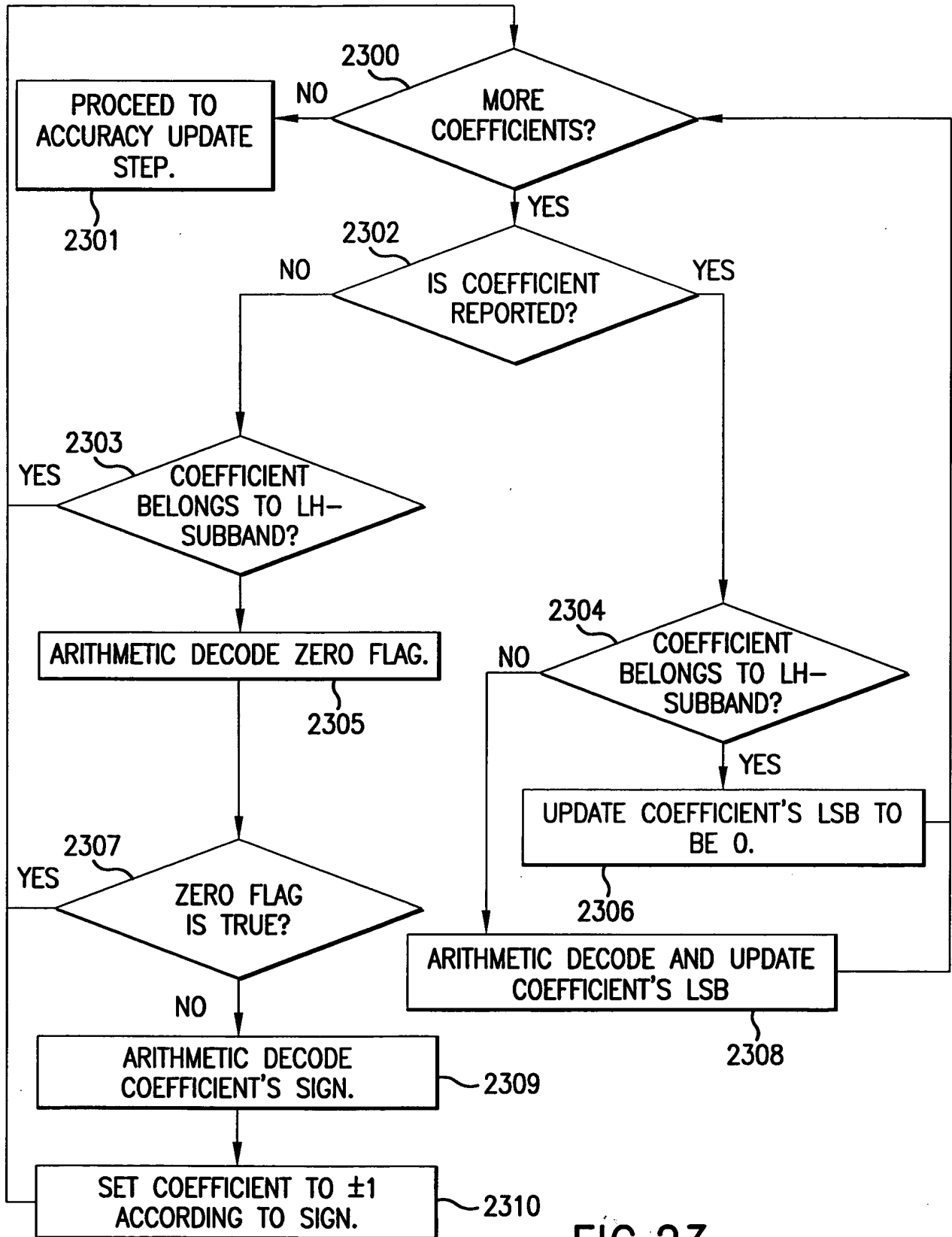


FIG.23

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24/26

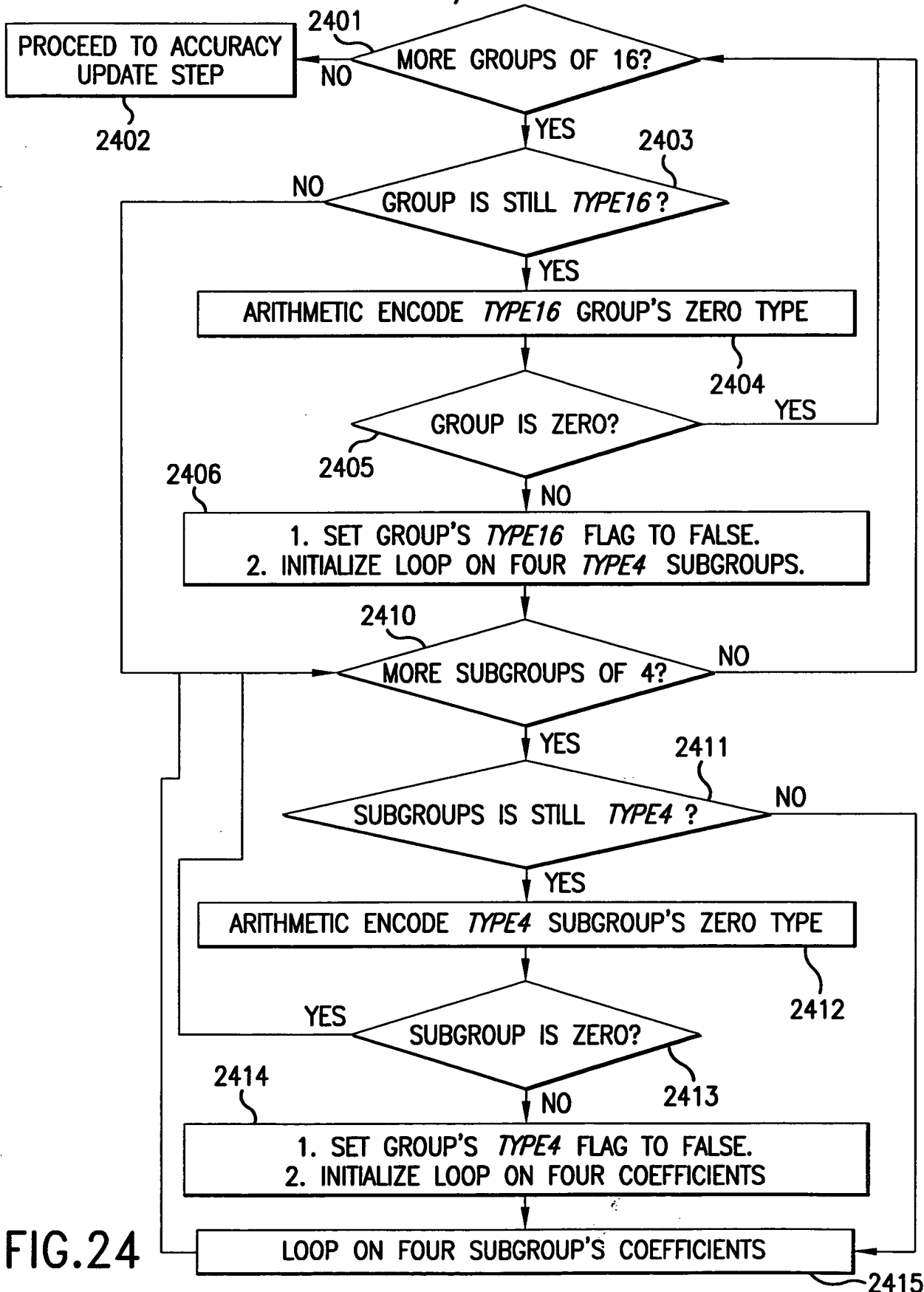


FIG.24

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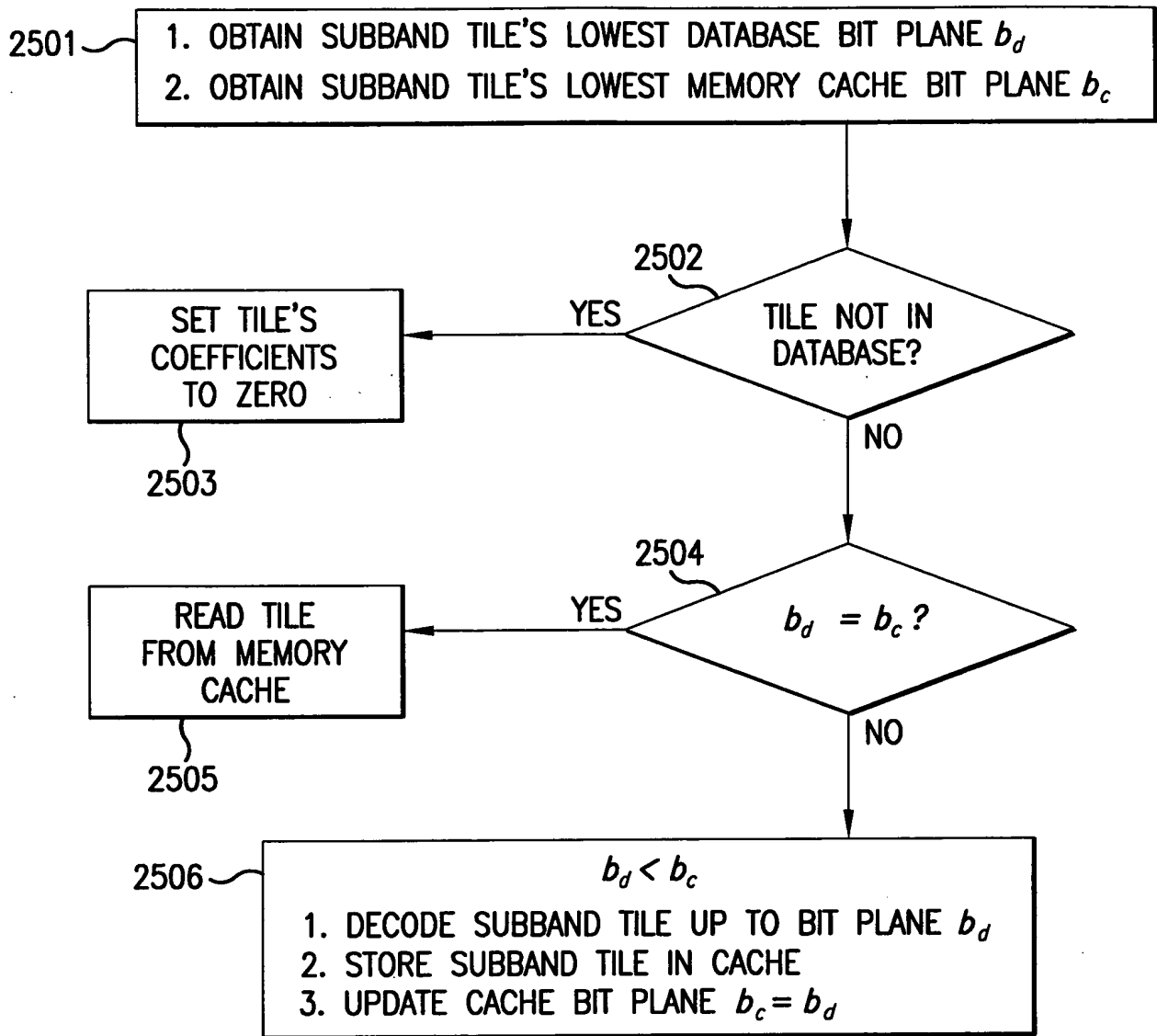


FIG.25

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PREPROCESSING MULTIREOLUTION STRUCTURE

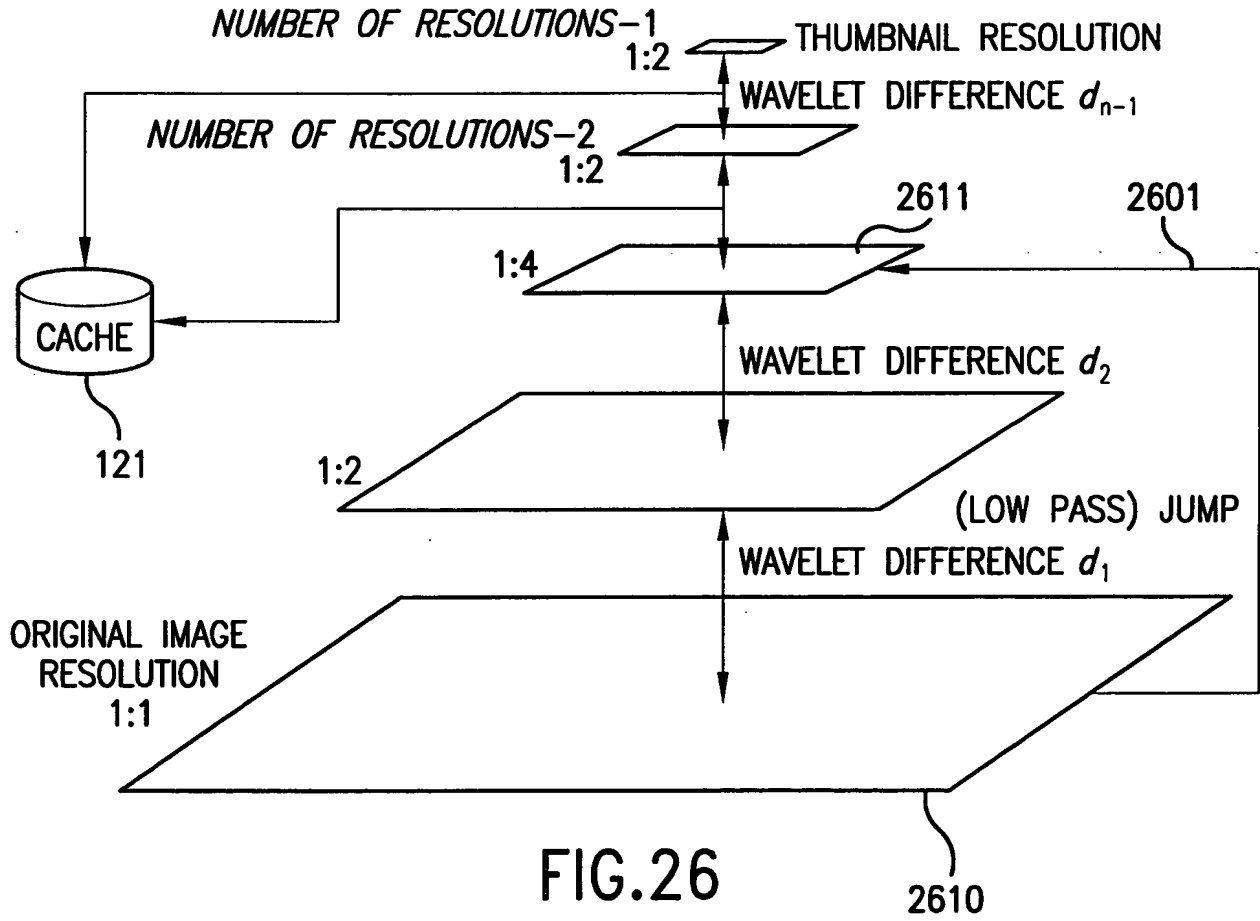


FIG.26

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